

AMENDMENTS TO THE SPECIFICATION:

Please amend the specification as follows:

Please replace the paragraph beginning on page 1, line 15 of the specification with the following amended paragraph:

a¹
This plasma processing apparatus 11 has a processing container 13 on which an antenna 15 is mounted. The antenna 15 is formed by an annularly-curved waveguide having its end closed and has slots 17 . . . formed on the side of the processing container ~~[[15]]~~ 13. The other end of the antenna 15 is connected to a microwave oscillator 19.

Please replace the paragraph beginning on page 7, line 21 of the specification with the following amended paragraph:

a²
FIGS. 1A, 1B, 1C and 2 are structural views showing the plasma processing apparatus of the first embodiment. In FIG. 1A, this plasma etching apparatus 51 has a processing container 53 whose sidewall and bottom are made of conductive material, such as aluminum, and which is shaped to be a cylinder with bottom, as a whole. The ceiling part of the container 53 is opened, whereas it is sealed by a sealing plate 55 having a thickness to endure a vacuum pressure through a sealant, such as O-ring, in an air-tight manner. This sealing plate 55 is made from dielectric material exhibiting heat-resistance, microwave permeability and small dielectric loss, for example, silica glass, alumina, ceramics of aluminum nitride or the like. Owing to the provision of the sealing plate 55, there is defined a processing space ~~[[17]]~~ 57 in the processing

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

container 53. Fitted on the sealing plate 55 is a cover member 59 in the form of a circular lid of conductive material, which is fixed on the processing container 53.

Please replace the paragraph beginning on page 8, line 25 of the specification with the following amended paragraph:

On the outside face of the annular antenna 73, a propagation waveguide 81 is connected tangential to the antenna 73 through a directional coupler 79. The other end of the propagation waveguide 81 is connected to a microwave oscillator 83 for supplying the microwave. The directional coupler 79 operates to make the microwave, which has been propagated in the waveguide 81 from the microwave oscillator 83 in the direction of arrow A in the figure, propagate only in the direction of arrow B in the annular antenna 73. Consequently, the microwave as a traveling wave is propagated in the annular antenna 73 in the form of an endless ring, only in the only one direction (the direction of arrow B). A microwave absorber 85 is detachably attached to the inside of an end of the propagation waveguide 81 on the side of the directional coupler 79. The microwave absorber 85 operates to prevent the microwave propagated in the propagation waveguide 81 in the direction of arrow A from being reflected on the end of the propagation waveguide 81 into a standing wave, thereby to maintain a traveling wave. Note, it is also possible to change a traveling-wave mode to a standing-wave mode by replacing the microwave absorber by a microwave reflector. In such a constitution, the above annular antenna 73, the directional coupler ~~[[70]]~~ 79 and the propagation waveguide 81 constitute a ring resonator 74. In the ring resonator 74, it is preferable to employ a so-called "short-slot" hybrid having a degree of coupling 3 dB for

the directional coupler 79. In case of arranging a plurality of directional couplers in the circumferential direction of the above annular waveguide, a path length of waveguide between the adjoining directional couplers has only to be adjusted together with the adjustment in phases of the so-supplied microwaves so that a traveling wave can be formed in a single direction of the annular waveguide.

Please replace the paragraph beginning on page 11, line 16 of the specification with the following amended paragraph:

Q4
FIG. 3 is a view showing a plasma processing apparatus 121 in accordance with the second embodiment of the present invention. This plasma processing apparatus 121 is similar to the plasma processing apparatus 51 besides a gas supply tube 123 arranged at the center of the sealing plate 55 surrounded by the annular antenna 73. This gas supply tube has a lower part funnel-shaped so as to gradually increase its diameter as approaching the lowermost end provided with a number of nozzles 125. In this way, since the antenna 73 supplying the processing container 53 with the microwave is in the form of a circular loop, the gas supply tube 123 can be provided at the central opening of the antenna ~~[[53]]~~ 73. Accordingly, it is possible to supply the wafer W with reactive gas etc. uniformly, thereby preventing the uneven processing due to unequal gas supply.

Please replace the paragraph beginning on page 17, line 31 of the specification with the following amended paragraph:

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

03
Additionally, in order that a phase of microwave supplied from the supply port A agrees with a phase of microwave again returning the supply port A after being propagated in the annular waveguide, its circumferential length has to be a natural number of times as long as a wave length in the annular waveguide. Note, in this specification, the above circumferential length designates a length of a center line 403 of the section of an annular waveguide 401, as shown in FIG. 16.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER ^{LLP}

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com